

## ABSTRACT

The present invention provides drilling fluids that comprise a base fluid and a water-soluble relative permeability modifier. In addition, the present invention provides methods of reducing the permeability of a subterranean formation to aqueous-based fluids during the drilling phase that comprises providing a water-soluble relative permeability modifier; and placing the water-soluble relative permeability modifier into the subterranean formation during the drilling phase. The present invention provides methods of drilling a well bore in a subterranean formation comprising providing a drilling fluid that comprises a base fluid and a water-soluble relative permeability modifier, and placing the drilling fluid in the subterranean formation. The water-soluble relative permeability modifiers of the present invention generally may comprise hydrophilically modified polymers, hydrophobically modified polymers, or water-soluble polymers without hydrophobic or hydrophilic modification.